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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHIN-CHUNG CHUANG, SHIN-JIEN KUO,
CHAO-YUN CHENG, and SHU-FENG WU

Appeal 2009-006845
Application 10/708,642
Technology Center 1700

Decided: January 07, 2010

Before ALLEN R. MACDONALD, *Chief Administrative Patent Judge*,
EDWARD C. KIMLIN, and TERRY J. OWENS,
Administrative Patent Judges.

KIMLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-5, 8-12, and 21.
We have jurisdiction under 35 U.S.C. § 6(b).

Claim 1 is illustrative:

1. A front-end array process for making a liquid crystal display panel, comprising:

depositing a molybdenum-containing metal layer on a glass substrate, wherein said molybdenum-containing metal layer is a dual-metal layer;

forming a patterned photoresist on said molybdenum-containing metal layer, wherein said patterned photoresist defines a gate and word line array pattern; and

using said patterned photoresist as an etching mask, uniformly etching said molybdenum-containing metal layer to form said gate and word line array pattern having substantially oblique sidewalls, wherein said etching of said molybdenum-containing metal layer uses gas mixture, wherein said etching of said molybdenum-containing metal layer is detected by an end-point detection method.

The Examiner relies upon the following references as evidence of obviousness (Ans. 4):

Przybysz	4,904,980	Feb. 27, 1990
Kim	4,981,816	Jan. 01, 1991
Cheung	5,354,417	Oct. 11, 1994
Hori	5,445,710	Aug. 29, 1995
Rioux	5,554,488	Sep. 10, 1996
Hong	6,429,057 B1	Aug. 06, 2002
Celii	2003/0143853 A1	Jul. 31, 2003
Nagata	JP 05-067590A	Mar. 19, 1993

Appellants' claimed invention is directed to a process for making a liquid crystal display panel. The process entails forming a photoresist pattern defining a gate and word line array pattern on a molybdenum-containing metal layer and photolithographically etching the pattern into the metal layer wherein the pattern has substantially oblique sidewalls. The etchant is a mixture of gases.

The appealed claims stand rejected under 35 U.S.C. § 103(a) as follows:

- (a) claims 1 and 21 over Hong in view of Rioux and Kim,
- (b) claim 2 over Hong, Rioux, Kim, and Przybysz,
- (c) claims 3, and 9-12 over Hong, Rioux, Kim, and Hori,
- (d) claim 4 over Hong, Rioux, Kim, and Cheung,
- (e) claim 5 over Hong, Rioux, Kim, and Celii, and
- (f) claim 8 over Hong, Rioux, Kim, and Nagata.

Appellants do not present separate arguments for any particular claim on appeal, and only address the rejections of independent claims 1 and 21. In addition, Appellants do not make a separate, substantive argument for claim 21. Accordingly, all the appealed claims stand or fall together with claim 1.

We have thoroughly reviewed each of Appellants' arguments for patentability. However, we are in complete agreement with the Examiner that the claimed subject matter would have been obvious to one of ordinary skill in the art within the meaning of § 103 in view of the applied prior art. Accordingly, we will sustain the Examiner's rejection for essentially those reasons expressed in the Answer, and we add the following primarily for emphasis.

Appellants do not dispute the Examiner's factual determination that Hong, like Appellants, discloses a front-end array process for making a liquid crystal display panel comprising photolithographically etching a molybdenum-containing metal gate layer with a gaseous etchant mixture. As acknowledged by the Examiner, Hong is silent with respect to the etched pattern having the presently claimed substantially oblique sidewalls.

However, Appellants have not refuted the Examiner's finding that it was known in the art that photolithographic etching of metal patterns does not produce a perfectly vertical sidewall but necessarily forms an oblique sidewall. Furthermore, Rioux evidences that it was known in the art that the controlled, gaseous photolithographic etching of metal layers to produce a gate structure forms oblique sidewalls. This is clearly depicted in Figures 1 and 2 of Rioux which represent the prior art. Accordingly, we find no error in the Examiner's conclusion that it would have been obvious to one of ordinary skill in the art that the etched metal pattern of Hong has oblique sidewalls, particularly since "Rioux teaches it avoids undercutting, and etch damage in subsequent process (ab), an [sic, a] known process improvement" (Ans. 5, penultimate para.).

Appellants maintain that the tapered sidewalls of Rioux are "not formed by etching but by deposition" (App. Br. 14, first para.). Appellants contend that the deposition of the conductive layer 48 of Rioux is the essential reason for forming the tapered gate structure 54 (*Id.* at second para.). However, Appellants' argument misses the thrust of the Examiner's rejection. The Examiner's rejection is based upon the background section of Rioux, which clearly teaches that it was known in the art to form oblique sidewalls on metal gate patterns by photolithographically etching with a gaseous mixture. Appellants' argument focuses upon the deposition process of Rioux but does not address the background disclosure of the reference that is clearly illustrated in Figures 1 and 2.

As a final point, we note that Appellants base no argument upon objective of non-obviousness, such as unexpected results.

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In conclusion, based on the foregoing, the Examiner's decision rejecting the appealed claims is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a) (2008).

AFFIRMED

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